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Durable icephobic oleogel coating for effective anti-icing and de-icing[1] GYU DO PARK, JAE HYEON LEE, SANG JOON LEE, Pohang University of Science Technology, BBRC TEAM — Icing and frosting cause many problems for communication and power lines, wind turbines, and solar panels. Accordingly, several anti-icing and de-icing technologies have been developed, but these energy-intensive technologies induce a lot of economic loss. It is therefore necessary to develop an effective and sustainable icephobic surface without the use of external energy. In this study, a new icephobic surface impregnated with a lubricant was developed. The ice adhesion strength was measured to evaluate the icephobic property of the surface. The ice adhesion of the proposed surface was measured as 0.39 kPa, much smaller than that of conventional icephobic surfaces. In particular, the measured strength is much smaller than 20 kPa. Thus, the adhered ice can be removed by natural wind or gravity without the supply of any external energy. The low ice adhesion strength was well maintained for 10 icing/de-icing cycles, which indicates high sustainability of the proposed oleogel coating. The present results demonstrate the realization of a highly effective and durable icephobic surface. The proposed oleogel coating would be utilized for various other engineering applications, including anti-biofouling, water-repellence and self-cleaning.

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